

Appl. No. 09/751,215  
Amendment dated January 31, 2005  
Reply to Office Action of October 29, 2004

### REMARKS

#### Claim Rejections – 35 U.S.C. § 103

The Examiner has rejected claims 1, 3 and 4 under 35 USC 103(a) as being unpatentable over Edelstein et al. (U.S. Patent No. 6,181,012). The Examiner has rejected claims 1, 3 and 4 under 35 USC 103(a) as being unpatentable over Shimomura (U.S. Patent No. 6,352,920) over Edelstein et al. ('012). The Examiner has rejected claims 1, 3 and 4 under 35 USC 103(a) as being unpatentable over Pavate et al. (U.S. Patent No. 6,432,819) in view of Edelstein et al. ('012). The Applicant respectfully traverses. The cited references, either individually or in combination, fail to teach or render obvious the claims 1, 3, and 4 as amended. In particular, the cited references fail to teach all of the claimed elements of independent claim 1, recited below:

- I. *A method for forming hardened interconnects comprising:  
depositing a metal layer to serve as an interconnect line;  
introducing a single metal species or a combination of metal species selected from the group consisting of silver, aluminum, zinc, zirconium, and magnesium to the metal layer;  
heating the deposited metal layer and the introduced metal species;  
allowing the metal layer to cool, so as to form precipitates of the introduced metal species; and  
after allowing said heated metal layer to cool, performing chemical-mechanical polishing wherein the additional metal precipitate hardens said deposited metal layer to reduce the rate of said polishing.*

In contrast, Edelstein teaches forming depositing a copper alloy seed layer and not an interconnect line to which metal species are introduced. Shimomura teaches forming a Cu alloy as the second conductive layer as illustrated in Figure 3(b) of Shimomura, but does not teach forming the alloy by depositing a metal layer and introducing a metal species into the

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metal layer. Pavate, similar to Edelstein, teaches forming a doped seed layer 210 of a copper layer 212. Therefore, the Applicant respectfully submits that independent claim 1, and the claims 3 and 4 that depend upon and incorporate the limitations of claim 1, are not taught or rendered obvious by the cited references.

Appl. No. 09/751,215  
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**ALLOWABLE SUBJECT MATTER**

Applicant thanks the Examiner for the allowance of claims 5 and 6.


Appl. No. 09/751,215  
Amendment dated January 31, 2005  
Reply to Office Action of October 29, 2004

If there are any additional charges, please charge Deposit Account No. 02-2666.

Respectfully submitted,

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Date: 1/31, 2005

  
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